

Ultima™ Remote Air Cooled Air Cooled Chiller 75kW - 450kW



TECHNICAL MANUAL



FM00542

EMS52086

About Airedale Products & Customer Services

WARRANTY

All AIAC products or parts (non consumable) supplied for installation within the UK mainland and commissioned by an AIAC engineer, carry a full Parts & Labour warranty for a period of 12 months from the date of commissioning or 18 months from the date of despatch, whichever is the sooner.

Parts or Equipment supplied by AIAC for installation within the UK or for Export that are properly commissioned in accordance with AIAC standards and specification, not commissioned by an AIAC engineer; carry a 12 month warranty on non consumable Parts only from the date of commissioning or 18 months from the date of despatch, whichever is the sooner.

Parts or equipment installed or commissioned not to acceptable AIAC standards or specification invalidate all warranty.

Warranty is only valid in the event that

In the period between delivery and commissioning the equipment: is properly protected & serviced as per the AIAC installation & maintenance manual provided where applicable the glycol content is maintained to the correct level.

In the event of a problem being reported and once warranty is confirmed as valid under the given installation and operating conditions, the Company will provide the appropriate warranty coverage (as detailed above) attributable to the rectification of any affected Airedale equipment supplied (excluding costs for any specialist access or lifting equipment that must be ordered by the customer).

Any spare part supplied by Airedale under warranty shall be warranted for the unexpired period of the warranty or 3 months from delivery, whichever period is the longer.

To be read in conjunction with the Airedale Conditions of Sale - Warranty and Warranty Procedure, available upon request.

CAUTION



Warranty cover is not a substitute for maintenance. Warranty cover is conditional to maintenance being carried out in accordance with the recommendations provided during the warranty period. Failure to have the maintenance procedures carried out will invalidate the warranty and any liabilities by Airedale International Air Conditioning Ltd.

SPARES

A spares list for 1, 3 and 5 years will be supplied with every unit and is also available from our Spares department on request.

TRAINING

As well as our comprehensive range of products, Airedale offers a modular range of Refrigeration and Air Conditioning Training courses, for further information please contact Airedale.

CUSTOMER SERVICES

For further assistance, please e-mail: enquiries@airedale.com or telephone:

UK Sales Enquiries	+ 44 (0) 113 238 7789	enquiries@airedale.com
International Enquiries	+ 44 (0) 113 239 1000	enquiries@airedale.com
Spares Hot Line	+ 44 (0) 113 238 7878	spares@airedale.com
Airedale Service	+ 44 (0) 113 239 1000	service@airedale.com
Technical Support	+ 44 (0) 113 239 1000	tech.support@airedale.com
Training Enquiries	+ 44 (0) 113 239 1000	marketing@airedale.com

For information, visit us at our Web Site: www.airedale.com

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Front Cover: Model URAC250DQ/DSQ Shown

Health and Safety

IMPORTANT The information contained in this manual is critical to the correct operation and maintenance of the unit and should be read by all persons responsible for the installation, commissioning and maintenance of this Airedale unit.


Safety The equipment has been designed and manufactured to meet international safety standards but, like any mechanical/electrical equipment, care must be taken if you are to obtain the best results.

- CAUTION



1

Installation, service and maintenance of Airedale equipment should only be carried out by technically trained competent personnel.
- CAUTION



2

When working with any air conditioning units ensure that the electrical isolator is switched off prior to servicing or repair work and that there is no power to any part of the equipment.
- 3

Also ensure that there are no other power feeds to the unit such as fire alarm circuits, BMS circuits etc.
- 4

Electrical installation commissioning and maintenance work on this equipment should be undertaken by competent and trained personnel in accordance with local relevant standards and codes of practice.
- 5

The refrigerant used in this range of products is classified under the COSHH regulations as an irritant, with set Workplace Exposure Levels (WEL) for consideration if this plant is installed in confined or poorly ventilated areas.
- 6

A full hazard data sheet in accordance with COSHH regulations is available should this be required.

Protective Personal Equipment Airedale recommends that personal protective equipment is used whilst installing, maintaining and commissioning equipment.

Refrigerant Warning The Airedale Remote air cooled chiller uses R407C refrigerant which is a high pressure refrigerant. It requires careful attention to proper storage and handling procedures.

Use on manifold gauge sets designed for use with R407C refrigerant. Use only refrigerant recovery units and cylinders designed for high pressure refrigerants.

R407C must only be charged in the liquid state to ensure correct blend makeup.

The refrigerant must be stored in a clean, dry area away from sunlight. The refrigerant must never be stored above 50°C.

Manual Handling Some operations when servicing or maintaining the unit may require additional assistance with regard to manual handling. This requirement is down to the discretion of the engineer. Remember do not perform a lift that exceeds your ability.

Environmental Considerations

FREEZE PROTECTION

Airedale recommends the following actions to help protect the unit during low temperature operation. This also includes the units subject to low ambient temperatures.

Units with supply water temperatures below +5°C

- Glycol is recommended when a supply water temperature of +5°C or below is required or when static water can be exposed to freezing temperatures.

Units subject to ambient temperatures lower than 0°C

- Glycol of an appropriate concentration ⁽¹⁾ is used within the system to ensure adequate protection. Please ensure that the concentration is capable of protection at least 3°C lower than ambient.
- Water / glycol solution is constantly circulated through all waterside pipework and coils to avoid static water from freezing.
- Ensure that pumps are started and running even during shut down periods, when the ambient is within 3°C of the solution freeze point ⁽¹⁾ (i.e. if the solution freezes at 0°C, the pump must be operating at 3°C ambient).
- Additional trace heating is provided for interconnecting pipework.

⁽¹⁾ Referrer to your glycol supplier for details

ENVIRONMENTAL POLICY

It is our policy to:

- Take a proactive approach to resolve environmental issues and ensure compliance with regulatory requirements.
- Train personnel in sound environmental practices.
- Pursue opportunities to conserve resources, prevent pollution and eliminate waste.
- Manufacture products in a responsible manner with minimum impact on the environment.
- Reduce our use of chemicals and minimise their release to the environment.
- Measure, control and verify environmental performance through internal and external audits.
- Continually improve our environmental performance.

CE Directive



Airedale certify that the equipment detailed in this manual conforms with the following EC Directives:

Electromagnetic Compatibility Directive (EMC)	2014/30/EU
Low Voltage Directive (LVD)	2014/35/EU
Machinery Directive (MD)	89/392/EEC version 2006/42/EC
Pressure Equipment Directive (PED)	97/23/EC
	Article 13 of 2014/68/EU

To comply with these directives appropriate national & harmonised standards have been applied. These are listed on the Declaration of Conformity, supplied with each product.

Maximum and Minimum Operation Temperature (TS) and Pressure (PS)
 Operating Temperature (TS), TS = Min -20°C to Max 120°C *
 Maximum Operating Pressure (PS) PS = High Side 26 Barg

*Based upon the maximum machine running temperatures.

General Description

UNIT IDENTIFICATION

REMOTE AIR COOLED LIQUID CHILLER	
URAC	Ultima Remote Air Cooled Chiller
75 – 450	Model Size (Expressed as Nominal Cooling in kW)
D	Double Circuit - Standard Chiller
DQ	Double Circuit - Quiet Chiller
DSQ	Double Circuit - Super Quiet Chiller
Example	URAC250DQ

INTRODUCTION

The Airedale range of Ultima Remote Air Cooled liquid chillers covers the nominal capacity range 75kW to 450kW in 45 model sizes incorporating Standard **D**, Quiet **DQ** and Super Quiet **DSQ** variations.

Attention has been placed on maximising the unit's performance while keeping the sound and vibration levels and footprint to an absolute minimum.

The range has been specifically designed for plant room installations.

A matching range of Air Cooled Condensers is available to complement the Remote Air Cooled Liquid Chiller, please refer to the Air Cooled **Condenser Specification**.

REFRIGERANTS

The range has been designed and optimised for operation with the ozone benign R407C refrigerant.

STANDARD FEATURES

Standard Chiller - D

The Standard Ultima Air Cooled Remote Chiller comes complete with:

- **AIRE**Tronix Microprocessor Control
- Evaporator Pad Heater
- Multiple Scroll Compressors
- Plate Evaporator
- Connections to Remote Condenser
- Dual Independent Refrigeration Circuits
- Electronic Expansion Valve(s)
- Connections for External Trace Heating (240V/500W available)
- A set of 4 M24 collared eye bolts to BS4278

Quiet Chiller - DQ

With the benefits of the Standard range, the Quiet chiller is supplied with an acoustic package, which incorporates:

- Compressor enclosure lined with Acoustic material

Super Quiet Chiller - DSQ

With the benefits of the Standard range, the Super Quiet chiller is supplied with a Quiet acoustic package, which incorporates the following to become one of the quietest chillers available:

- Compressor enclosure lined with 40mm Acoustic material

General Description

STANDARD FEATURES

Construction

The base and superstructure are fabricated from galvanised steel to ensure a tough, durable, weatherproof construction.

Unit panels are manufactured from galvanised sheet steel coated with epoxy baked powder paint to provide a durable and weatherproof finish.

Standard unit colour is Light Grey (RAL 7035).

Compressors and evaporator are mounted on a rigid galvanised heavy-duty frame. Fully locked electrical panels are situated at one end of the unit. Access to the compressors is via end panels adjacent to the electrical control panel.

A set of 4 M24 collared eye bolts to BS4278 are supplied.

Evaporator

Stainless steel high efficiency brazed plate heat exchanger(s) will allow optimum heat transfer between media. Each heat exchanger is insulated with closed cell polyurethane foam to Class 0 fire rating.

Water inlet and outlet connections suit "Victaulic" type pipe and coupling assembly (counter-pipes and clamps supplied as an optional extra).

A pad heater is fitted to the evaporator and will protect against freeze up in ambient temperatures as low as -20°C.

Compressor

Tandem / Trio scroll compressors comprising 2/3 scroll compressors linked to provide 1 refrigeration circuit.

Each compressor includes internal motor protection, internal pressure relief, non return valve, discharge temperature protection and sight glass. Each compressor is equipped with oil heater to guard against oil foaming on start up.

Each Tandem / Trio has an oil equalisation line.

The compressors are mounted to the rigid galvanised heavy duty sub-frame with the use of vibration reducing isolation.

General Description

STANDARD FEATURES

Refrigeration

Each refrigeration circuit is supplied with the following:

- Full operating charge of R407C
- Electronic expansion valve
- Liquid line ball valve
- Discharge line ball valve
- Large capacity filter drier with replaceable cores
- Liquid line sight glass
- Low pressure switch with manual reset via microprocessor controller
- High pressure switch with manual reset
- Suction and liquid pressure transducers
- Pressure relief valve with integral rupture disc and indicator gauge

Controls

AIRETronix microprocessor controller can provide 4-6 stages of capacity control, dependent upon model type, as standard. The controller incorporates full Building Management System capabilities, full details can be found in the **Controls** section.

Electrical

Dedicated weatherproof electrical power and controls panels are situated at the end of the unit and contain:

- Separate, fully accessible, controls compartment, allowing adjustment of control set points whilst the unit is operational
- Circuit breakers for protection of all major unit components
- Separate, permanent supply for controls/trace heating, 230v/50Hz/1ph
- The electrical power and control panel is wired to the latest European standards and codes of practice
- Separate door locking electrical isolation for each mains compartment

OPTIONAL EXTRAS – ENERGY SAVING

Power Factor Correction

When applied to the motors of each compressor, the compressor power factor is controlled to a minimum operating value of 0.95 at the full operating capacity. This satisfies many supply authorities that may impose surcharges on equipment with power factor less than 0.95.

General Description

OPTIONAL EXTRAS – GENERAL

Anti Vibration Mounts (Spring Type)	<p>Spring vibration isolators can be supplied loose for on site fitting to the base frame of each chiller unit.</p> <p>The isolators are suitable for fitting to a concrete slab or structural steelwork providing the surface is level and of sufficient strength where a high level of vibration elimination is required.</p>
Anti Vibration Mounts (Pad Type)	<p>Pad vibration isolators can be supplied loose for on site fitting to the base frame of each chiller unit.</p> <p>The isolators are suitable for fitting to a structural steelwork only, providing the surface is level and of sufficient strength where a moderate degree of vibration elimination is required.</p>
Sequence Control	<p>For the efficient temperature and capacity operation of multiple units on a single site, the sequence controller will permit interlinked operation of the complete system thereby providing optimum temperature control and minimum power consumption.</p> <p>Included within this package is a site visit by Airedale Control Specialists to set up multiple unit sequence control.</p>
BMS Interface Card	<p>Enables AIRETronix Controlled chillers to be interfaced with most BMS, factory fitted, please contact Airedale.</p>
Dual Pressure Relief Valve	<p>A 3-way dual shut-off valve that incorporates 2 relief valve and rupture disc assemblies per circuit. The valve allows the maintenance of individual pressure relief valves and rupture discs without the need for refrigerant evacuation.</p>
Electronic Soft Start	<p>The electronic soft start enables the chiller compressor motor to be ramped to speed with the minimum full load current. Further benefits include removal of nuisance tripping, supply voltage dips and motor overheating.</p>
Leak Detection Kit (DQ & DSQ Models Only)	<p>A factory calibrated and fitted leak detection kit, will raise an alarm when refrigerant gas is detected.</p>
Flow Switch	<p>The flow switch will protect the chiller against low water flow, supplied loose.</p>
Water Filter	<p>20 mesh water filter(s) can be fitted on the inlet water pipework to protect the evaporator from clogging by sediment, (supplied loose).</p>
“Victaulic” Counterpipe Kit	<p>A pair of grooved counterpipes and clamps for each heat exchanger can be supplied for waterside connections.</p>
Alternative Refrigerant	<p>For applications outside the EU, units can be supplied for use with R22, please specify at time of order.</p>
Commissioning	<p>Airedale Service provides a full commissioning service carried out by professionally trained, industry experienced engineers. For a competitive quotation, please contact Airedale Customer Services.</p>
Chillerguard®	<p>In addition to commissioning, a 24 hour, 7 days a week on-call service is on available throughout the year. This service will enable customers to contact a duty engineer outside normal working hours and receive assistance over the telephone. The duty engineer can, if necessary, attend site, usually within 24 hours or less. Full details will be forwarded on acceptance of the maintenance agreement.</p>

Design Features & Information

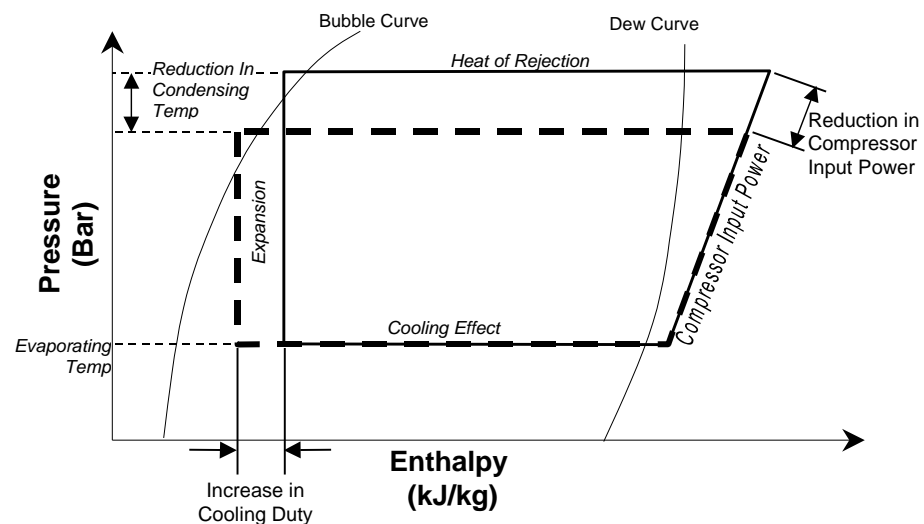
ENERGY EFFICIENCY

Electronic Expansion Valves (EEV)

Whilst offering versatile control at the full design duty of the chiller, standard Thermostatic Expansion Valves (TEV) do not automatically optimise themselves to all operating conditions. Therefore, if the chiller is operating at 40% or 50% of full load, especially at a lower ambient temperature than that for which the valve was sized, the conventional TEV must have the design head pressure available to ensure good refrigerant control. Maintaining an artificially high condensing pressure is normal in conventional systems, however, this leads to higher operating costs.

Using an EEV allows for good refrigeration control with the chiller operating at part load and lower ambient conditions with a reduced condensing pressure. By fitting an EEV and adjusting the head pressure control setting, **reduction in energy running values of up to 27% can be achieved**. The Mollier diagram shown below helps to illustrate how this increase in efficiency is achieved.

EEV's differ to normal thermostatic expansion valves in their ability to maintain control of refrigerant flow and the suction superheat at reduced head pressures. The turn-down rate of a typical EEV is superior to that of its thermostatic equivalent, such that a reduced optimum condensing pressure can be maintained at low compressor load. However low the load is on the compressor, from zero to 100%, there will not be a problem with turn down, even below 30% rated capacity.



Key

- — — — — Cooling Cycle @ 22°C ambient with a conventional TEV fitted.
- - - - - Cooling cycle @ 22°C ambient, demonstrating a typical EEV condensing temperature taking full advantage of lower ambient air temperatures (below 30°C).

Design Features & Information

MINIMUM SYSTEM WATER VOLUME CALCULATIONS

METHOD 1

Where the system permanent heat load is known:

$$V_m = \frac{\text{Water Flow Rate (litres/minute)} \times \text{Minimum Compressor Run Time (mins)} \times \text{Chiller Loading Factor}}{1}$$

Where V_m is the minimum water volume in litres
Minimum Compressor Run Time is 2 minutes

$$\text{Chiller Loading Factor} = \frac{\text{Minimum Turndown (kW)} \times 1.2}{\text{Permanent Heat Load}}$$

The Chiller Loading Factor limits:

Max 1.00

Min 0.25

Example 250 kW Chiller, 7/12°C Water, Model URAC250DQ with a permanent load of 95 kW

$$V_m = \frac{250 \times 60}{4.19 \times 5} \times 2 \times \frac{60 \times 1.2}{95} = 1085 \text{ litres}$$

METHOD 2

Where the system permanent heat load is unknown:

$$V_m = \frac{\text{Water Flow Rate (litres/hour)} \times \text{Minimum Turndown Ratio} \times 1.2}{\text{Maximum Compressor Starts Per Hour}}$$

Where Minimum Turndown Ratio = $\frac{\text{Minimum Stage Capacity (kW)}}{\text{Chiller Full Capacity (kW)}}$

Example 250 kW Chiller, 7/12°C Water, Model URAC250DQ permanent load unknown.

$$V_m = \frac{250 \times 3600}{4.19 \times 5} \times \left(\frac{60}{250} \times 1.2 \right) \times \frac{1}{12} = 1031 \text{ litres}$$



Method 1 is always preferred.

Design Features & Information

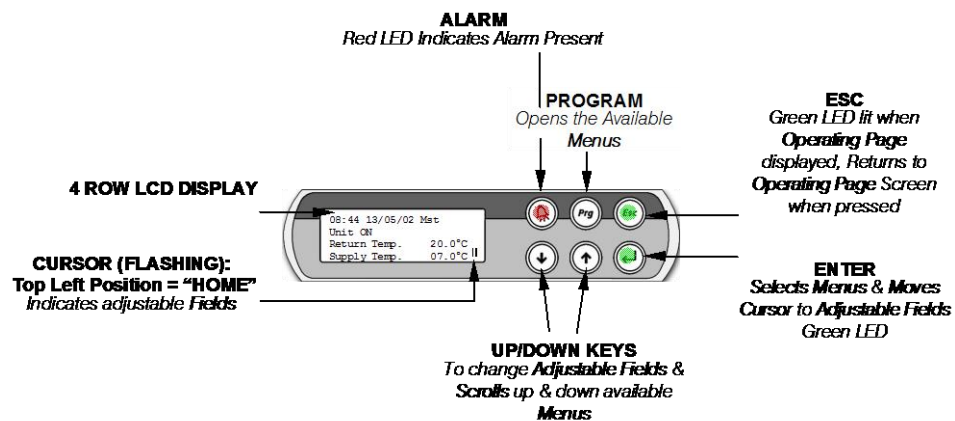
AIRETronix - CONTROLS

General Description

The microprocessor controller offers powerful analogue and digital control to meet a wide range of monitoring and control features including a real time clock and Industry standard communication port and network connections.


The controller's inbuilt display is used for viewing the unit operating status and making adjustments to control parameters by allowing the operator access to a series of display pages.

Also featured are a visual alarm and the facility to adjust and display control settings by local operator for information and control.



FEATURES

- Unit Remote ON/OFF** Disables/Enables the chiller remotely.
- Compressor Anti Cycle Control** Automatic via the Microprocessor.
- Compressor Load Limit** Limits the condensing pressure by unloading above 24Barg.
Limits the evaporating pressure by unloading at the minimum pressure setpoint, which is, adjustable depending on system glycol content.
- Remote Setback Temperature Setpoint Switch** A setback setpoint for supply water temperature can be selected to suit summer/winter conditions or night setback.
- Compressor Hours Run** Displays hours run of each compressor.
- Password Protection** The control system integrity can be maintained by restricting access with a password PIN number.

CAUTION  **IMPORTANT: To change the PIN number, please contact Airedale at time of order with the preferred 4 digit number.**

Design Features & Information

AIRETronix - CONTROLS

FEATURES

Temperature

The microprocessor maintains the set supply Chilled Water temperature by sensing the return and supply water temperatures, compressor loading.

The microprocessor also monitors and displays the following measured parameters:

- Supply Water Temperature
- Return Water Temperature
- Suction Pressure of each circuit
- Liquid Pressure of each circuit
- Suction Temperature at each circuit
- Superheat for each circuit

Alarms

The following conditions will be detected, triggering a visual display:

Common for both circuits:

- Low Supply Temperature
- Emergency Stop
- Water Flow

Individual for each circuit:

Individual alarms will isolate the affected circuit only.

- Compressor Trip
- Low Suction Pressure for each circuit
- High Liquid Pressure for each circuit
- Volt Free Contact Alarm Indication
- Low Pressure Switch
- Compressor Overload
- High Compressor Discharge Temperature

Networking

A Local Area Network (**AIRELan**) can be used to connect a number of chiller controllers to offer intercommunication and sequence control. This also allows the connection of computers, printers and modems on the same communications ring. For further details and quotation, please contact Airedale Controls.

Design Features & Information

CONTROL SCHEME FEATURES

Airedale recognises that all chiller applications are different but fall mainly into 2 application categories; Variable Supply Temperature and Constant Supply Temperature.

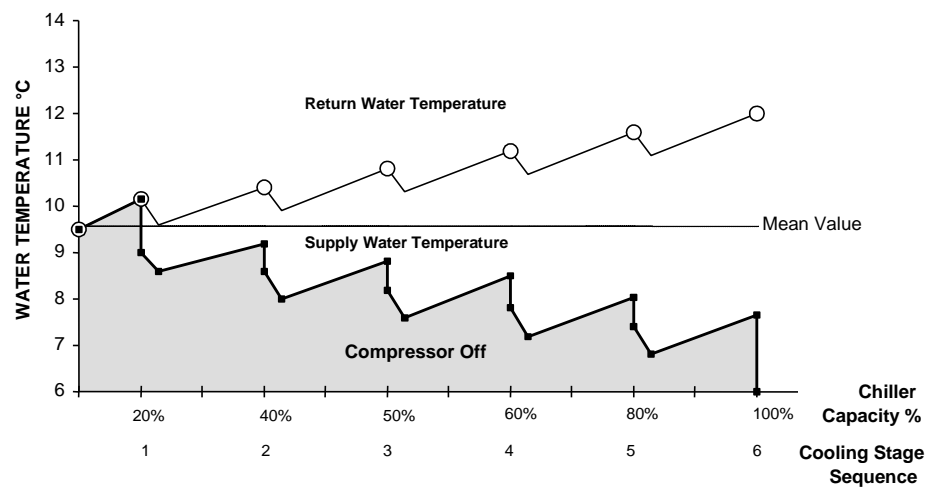
The onboard microprocessor has the capability of satisfying either control requirement as illustrated below. Using the Airedale Variable Supply Temperature control scheme, energy savings are available when compared with previous schemes and that of the Constant Supply Temperature application.

Variable Supply Temperature control schemes offer energy savings where the supply water temperature is not critical to its operation.

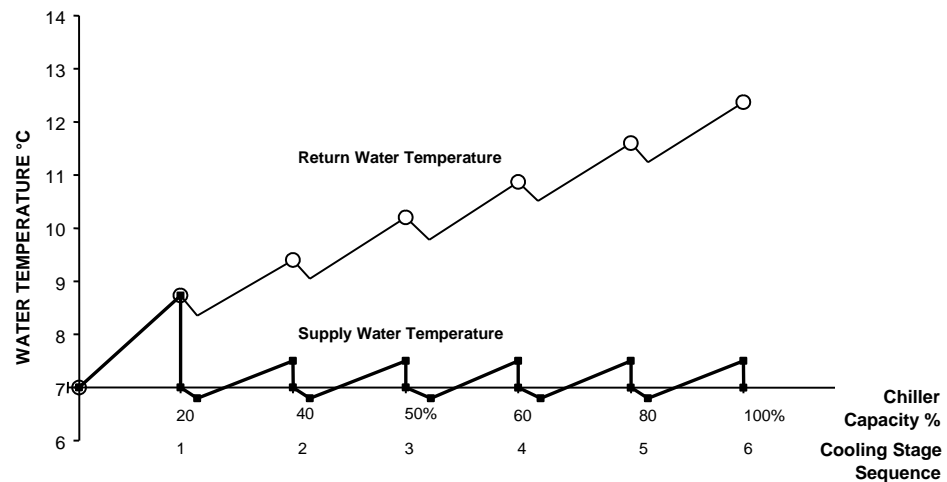
Selection of the best application control scheme can be made via a soft switch in the microprocessor during initial commissioning.

Examples based on Models URAC200D having 6 Stages of Cooling

Variable Supply Temperature Control



Constant Supply Temperature Control



CAUTION  Factory set to Variable Supply Temperature Control unless otherwise stated at order.

Only when the mode selection has been set can the unit be enabled.

Performance Data

CAPACITY DATA

	Dew Condensing Temperature								
Leaving Water Temperature °C	40°C		45°C		50°C		55°C		
	Output kW	Input kW	Output kW	Input kW	Output kW	Input kW	Output kW	Input kW	
URAC75	5	74.6	18.6	71.2	20.9	67.7	23.2	64.1	25.7
	6	77.6	18.6	74	20.9	70.3	23.3	66.6	25.7
	7	80.3	18.9	76.6	21.2	72.8	23.5	69	25.8
	10	89.2	19.1	85.2	21.3	81.1	23.6	77	25.9
URAC100	5	101.1	24.8	96.7	27.9	92.2	31.2	87.6	34.5
	6	104.9	24.8	100.4	28	95.7	31.2	91	34.5
	7	108.7	25.1	103.9	28.3	99.1	31.5	94.2	34.7
	10	120	25.3	114.8	28.5	109.6	31.7	104.4	34.9
URAC125	5	129.8	31.3	124.1	35.1	118.3	39	112.3	43.2
	6	134.8	31.3	128.9	35.1	122.9	39	116.6	43.2
	7	139.5	31.7	133.4	35.5	127.2	39.4	120.8	43.5
	10	154.9	31.9	148.3	35.6	141.4	39.5	134.4	43.6
URAC150	5	156.6	37.4	150	42.1	143.1	47	135.9	52.2
	6	162.4	37.6	155.6	42.2	144	47.1	140.9	52.3
	7	168	38.1	160.8	42.7	153.4	47.5	145.8	52.5
	10	185.9	38.6	178.1	43	170.1	47.7	161.8	52.6
URAC175	5	179.3	42.7	171.8	47.9	163.8	53.7	155.3	59.8
	6	186.1	42.7	178.3	48	170	53.7	161.2	59.8
	7	192.6	43.4	184.3	48.7	175.7	54.3	166.8	60.2
	10	213.2	43.6	204.3	48.9	195	54.5	185.4	60.4
URAC200	5	203.7	48	195	53.9	185.8	60.4	175.9	67.4
	6	211.6	47.7	202.7	53.6	193.1	60.1	182.8	67.3
	7	218.7	48.9	209.2	54.9	199.3	61.3	188.9	68.1
	10	242.3	48.5	232.2	54.5	221.6	61	210.5	68
URAC225	5	231	55	220	61.6	208.5	68.7	196.4	76.3
	6	239.9	55.1	228.4	61.7	216.5	68.8	204.1	76.3
	7	248.2	55.8	236.3	62.5	224	69.4	211.4	76.7
	10	275.2	56.2	262.2	62.9	248.9	69.9	235.4	77.1
URAC240	5	243.6	62	231.2	69.9	218.5	77.9	205.5	86.1
	6	252.6	62.2	239.7	69.9	226.6	77.9	213.2	86.1
	7	261.5	62.5	248.2	70.1	234.7	78	221	86
	10	289.4	63.2	275	70.6	260.5	78.1	245.8	85.8
URAC250	5	255.9	60.9	243.5	68.1	230.2	75.9	216.3	84.4
	6	265.7	61.3	252.6	68.5	238.9	76.3	224.7	84.6
	7	275.2	62.1	261.5	69.4	247.4	77	232.8	85.1
	10	305.1	62.5	290.3	69.7	275.1	77.2	259.5	85.1
URAC270	5	284.4	71.5	269.5	80.5	254.3	89.6	238.8	99.1
	6	294.8	71.7	279.4	80.5	263.8	89.7	247.9	99.1
	7	305.3	71.8	289.5	80.7	273.5	89.8	257.2	99.2
	10	338	72.4	321	81.2	303.8	90.2	286.4	99.3
URAC300	5	326	81	308.5	91	290.8	101.4	272.7	112.1
	6	337.9	81	320	91.1	301.7	101.5	283.1	112.3
	7	349.9	81.1	331.5	91.3	312.9	101.7	293.9	112.4
	10	387.5	81.4	367.8	91.7	347.9	102.3	327.8	113
URAC330	5	367.9	91.4	347	102.4	325.8	113.9	304.1	125.8
	6	381.5	91.5	360.1	102.6	338.2	114	316	125.9
	7	395.3	91.7	373.3	102.8	350.9	114.2	328.2	126
	10	438.4	92.4	414.8	103.5	390.9	114.9	366.7	126.5
URAC360	5	410.6	101.9	386.1	113.9	361.2	126.5	335.9	139.5
	6	426	102.1	400.9	114.1	375.3	126.6	349.2	139.5
	7	441.6	102.5	415.8	114.4	389.5	126.8	362.9	139.6
	10	490.3	103.5	462.5	115.4	434.5	127.5	406.1	140
URAC400	5	451.8	114.8	426.8	128.3	401.4	142.1	375.6	156.3
	6	468.6	115	442.8	128.4	416.6	142.3	390.1	156.5
	7	485.5	115.3	459	128.8	432.2	142.5	405	156.7
	10	538.5	116.2	509.9	129.6	481.1	143.3	452	157.3
URAC450	5	493.1	127.8	467.5	142.6	441.6	157.8	415.4	173.2
	6	511.3	127.9	484.9	142.7	458.2	157.9	431.1	173.5
	7	529.6	128.2	502.4	143.1	474.9	158.2	447.2	173.7
	10	586.8	128.8	557.4	143.9	527.8	159.1	498	174.6

- 1 Output kW refers to the chilled water duty. All performance data is supplied in accordance with BS EN 14511-1:2013
- 2 Input kW refers to the compressor input power.
- 3 Duties applicable for chilled water ΔT between 4 and 8°C.
- 4 Interpolate for water temperatures between those quoted, do not extrapolate
- 5 Water flow rate (l/s) = Output ÷ (4.19 × ΔT) Except Glycol use, refer to **Glycol Data**.
- 6 For conditions outside those quoted, please refer to Airedale.

Performance Data All performance data is supplied in accordance with BS EN 14511-1:2013

OPERATING LIMITS (For 100% Water)

Minimum Ambient Air DB °C	-5°C
Maximum Ambient Air DB °C	Refer to Capacity Data
Minimum Leaving Water Temperature °C	+5°C
Maximum Return Water Temperature °C	+20°C

- 1 Temperatures lower than those stated can be obtained with the addition of glycol.
- 2 For conditions outside those quoted, please refer to Airedale.

GLYCOL DATA Glycol is recommended when a supply water temperature of +5°C or below is required or when static water can be exposed to freezing temperatures.

Ethylene Glycol Nominal Correction Factors

Glycol in System / Freezing Point °C	10% / -4°C	20% / -9°C	30% / -15°C	40% / -23°C
Cooling Duty	0.98	0.97	0.95	0.93
Input Power	0.99	0.98	0.96	0.95
Water Flow	0.99	1.02	1.04	1.07
Pressure Drop	1.05	1.20	1.38	1.57

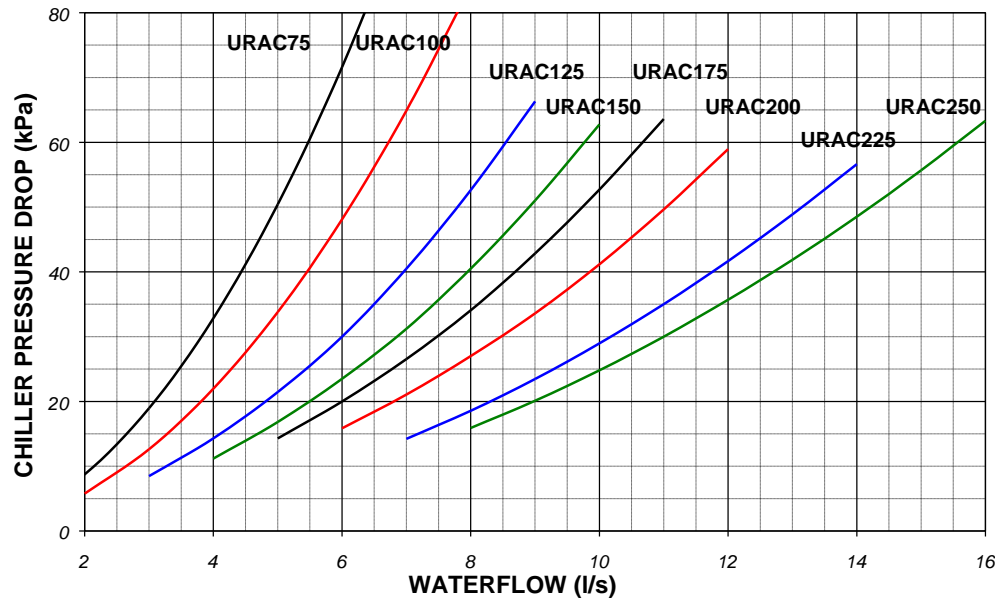
Propylene Glycol Nominal Correction Factors

Glycol in System / Freezing Point °C	10% / -2°C	20% / -6°C	30% / -12°C	40% / -20°C
Cooling Duty	0.97	0.95	0.91	0.88
Input Power	0.99	0.98	0.96	0.95
Water Flow	0.98	0.97	0.95	0.95
Pressure Drop	1.08	1.17	1.31	1.45

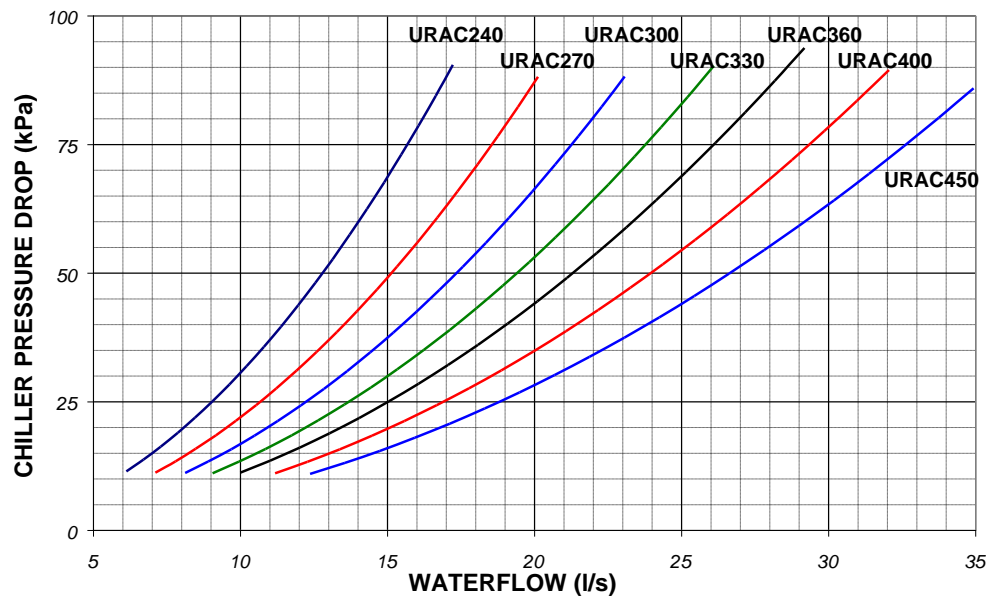
Performance Data

WATERSIDE PRESSURE DROPS

URAC75 – URAC250
(Except URAC240)



URAC240 – URAC450
(Except URAC250)



- (1) For glycol solutions, please refer to **Glycol Data**.
All performance data is supplied in accordance with BS EN 14511-1:2013

Performance Data

SOUND DATA

Measurement of Sound Data All sound data quoted has been measured in the third-octave band limited values, using a Real Time Analyser calibrated sound intensity meter in accordance with BS EN ISO9614 Part 1: 2009. **The Global sound data quoted is valid for sound emitted in the horizontal plane in all directions.**


All Sound Power Levels quoted are calculated from measured sound intensity according to BS EN ISO9614 Part 1: 2009.

Sound Pressure Levels are calculated from sound power using the expanded parallel piped method according to BS EN ISO11203: 2009.

Global Chiller Sound Level

Standard - D Models	Sound Measurement	Overall dB(A)	Frequency (Hz) dB						
			63	125	250	500	1000	2000	4000
URAC75D	Power	84	71	50	69	81	78	79	76
	Pressure @ 10m	53	39	19	37	49	46	47	44
URAC100D	Power	83	75	48	63	79	76	77	74
	Pressure @ 10m	51	43	16	32	47	45	46	42
URAC125D	Power	85	78	53	66	78	76	81	79
	Pressure @ 10m	54	47	21	34	46	44	49	47
URAC150D	Power	85	84	55	71	80	77	81	75
	Pressure @ 10m	53	53	23	39	48	46	49	44
URAC175D	Power	87	82	54	70	78	82	83	77
	Pressure @ 10m	55	51	23	38	47	50	51	45
URAC200D	Power	88	78	53	69	75	84	84	78
	Pressure @ 10m	57	46	21	38	44	52	53	46
URAC225D	Power	92	77	55	74	81	88	88	81
	Pressure @ 10m	61	45	23	42	49	56	57	49
URAC240D	Power	90	96	90	89	90	80	82	77
	Pressure @ 10m	62	68	62	61	62	52	54	49
URAC250D	Power	94	75	56	76	83	90	90	83
	Pressure @ 10m	63	43	25	45	52	58	59	51
URAC270D	Power	91	94	89	89	89	85	84	79
	Pressure @ 10m	63	66	61	61	61	57	56	51
URAC300D	Power	91	90	88	88	86	87	85	80
	Pressure @ 10m	63	62	60	60	58	59	57	52
URAC330D	Power	95	88	90	93	91	91	90	83
	Pressure @ 10m	67	60	62	65	63	63	62	55
URAC360D	Power	98	86	91	95	94	93	92	84
	Pressure @ 10m	70	58	63	67	66	65	64	56
URAC400D	Power	98	87	92	96	95	93	92	85
	Pressure @ 10m	70	59	64	68	67	65	64	57
URAC450D	Power	99	88	93	96	95	94	93	86
	Pressure @ 10m	71	60	65	68	67	66	65	58

- 1 dB(A) is the overall sound level, measured on the A scale.
All performance data is supplied in accordance with BS EN 14511-1:2013
- 2 All sound data measured at nominal conditions: Water in/out 12/7°C at 45°C dew point.

 The Sound Pressure data quoted is only valid in free field conditions, where the unit is installed on a reflective base. If the equipment is placed adjacent to a reflective wall, values may vary to those stated, typically increasing by 3dB for each side added.

Performance Data

All performance data is supplied in accordance with BS EN 14511-1:2013

SOUND DATA

Global Chiller Sound Level

Quiet - DQ Models	Sound Measurement	Overall dB(A)	Frequency (Hz) dB						
			63	125	250	500	1000	2000	4000
URAC75DQ	Power	81	67	66	75	77	74	75	72
	Pressure @ 10m	49	35	35	43	45	42	43	40
URAC100DQ	Power	79	71	64	69	75	72	73	70
	Pressure @ 10m	47	39	32	38	43	41	42	38
URAC125DQ	Power	81	74	69	72	74	72	77	75
	Pressure @ 10m	50	43	37	40	42	40	45	43
URAC150DQ	Power	81	80	71	77	76	73	77	71
	Pressure @ 10m	49	49	39	45	44	42	45	40
URAC175DQ	Power	83	78	70	76	74	78	79	73
	Pressure @ 10m	51	47	39	44	43	46	47	41
URAC200DQ	Power	84	74	69	75	71	80	80	74
	Pressure @ 10m	53	42	37	44	40	48	49	42
URAC225DQ	Power	88	73	71	80	77	84	84	77
	Pressure @ 10m	57	41	39	48	45	52	53	45
URAC240DQ	Power	89	95	89	89	90	77	77	71
	Pressure @ 10m	61	67	61	61	62	49	49	43
URAC250DQ	Power	90	71	72	82	79	86	86	79
	Pressure @ 10m	59	39	41	51	48	54	55	47
URAC270DQ	Power	89	93	88	88	88	81	79	72
	Pressure @ 10m	61	65	60	60	60	53	51	44
URAC300DQ	Power	88	89	87	87	86	84	80	74
	Pressure @ 10m	60	61	59	59	58	56	52	46
URAC330DQ	Power	93	88	89	92	91	87	84	77
	Pressure @ 10m	65	60	61	64	63	59	56	49
URAC360DQ	Power	95	86	90	94	94	89	87	78
	Pressure @ 10m	67	58	62	66	66	61	59	50
URAC400DQ	Power	96	86	91	95	95	90	87	79
	Pressure @ 10m	68	58	63	67	67	62	59	51
URAC450DQ	Power	96	87	92	96	95	91	88	80
	Pressure @ 10m	68	59	64	68	67	63	60	52

Super Quiet - DSQ Models	Sound Measurement	Overall dB(A)	Frequency (Hz) dB						
			63	125	250	500	1000	2000	4000
URAC75DSQ	Power	80	66	65	74	76	73	74	71
	Pressure @ 10m	48	34	34	42	44	41	42	39
URAC100DSQ	Power	78	70	63	68	74	71	72	69
	Pressure @ 10m	46	38	31	37	42	40	41	37
URAC125DSQ	Power	80	73	68	71	73	71	76	74
	Pressure @ 10m	49	42	36	39	41	39	44	42
URAC150DSQ	Power	80	79	70	76	75	72	76	70
	Pressure @ 10m	48	48	38	44	43	41	44	39
URAC175DSQ	Power	82	77	69	75	73	77	78	72
	Pressure @ 10m	50	46	38	43	42	45	46	40
URAC200DSQ	Power	83	73	68	74	70	79	79	73
	Pressure @ 10m	52	41	36	43	39	47	48	41
URAC225DSQ	Power	87	72	70	79	76	83	83	76
	Pressure @ 10m	56	40	38	47	44	51	52	44
URAC240DSQ	Power	88	94	88	88	90	72	69	63
	Pressure @ 10m	60	66	60	60	62	44	41	35
URAC250DSQ	Power	89	70	71	81	78	85	85	78
	Pressure @ 10m	58	38	40	50	47	53	54	46
URAC270DSQ	Power	87	92	87	87	88	76	72	64
	Pressure @ 10m	59	64	59	59	60	48	44	36
URAC300DSQ	Power	85	88	86	86	85	79	73	65
	Pressure @ 10m	57	60	58	58	57	51	45	37
URAC330DSQ	Power	90	87	88	91	91	82	77	68
	Pressure @ 10m	62	59	60	63	63	54	49	40
URAC360DSQ	Power	92	85	89	93	93	84	79	70
	Pressure @ 10m	64	57	61	65	65	56	51	42
URAC400DSQ	Power	93	85	90	94	94	85	80	71
	Pressure @ 10m	65	57	62	66	66	57	52	43
URAC450DSQ	Power	94	86	91	95	95	86	81	72
	Pressure @ 10m	66	58	63	67	67	58	53	44

1 dB(A) is the overall sound level, measured on the A scale.

2 All sound data measured at nominal conditions: Water in/out 12/7°C at 45°C dew point.



The Sound Pressure data quoted is only valid in free field conditions, where the unit is installed on a reflective base. If the equipment is placed adjacent to a reflective wall, values may vary to those stated, typically increasing by 3dB for each side added.

General Specification

MECHANICAL DATA			URAC75	URAC100	URAC125	URAC150	URAC175
Duty – Cooling							
Cooling Only	(1)	kW	76.6	103.9	133.4	160.8	184/3
Nominal Input	(1)	kW	21.2	28.3	35.5	42.7	48.7
EER	(2)		3.6	3.6	3.7	3.7	3.7
Capacity Steps		%	0-25-50-75-100	0-25-50-75-100	0-25-50-75-100	0-25-50-75-100	0-20-30-50-70-80-100
Dimensions - H x L x W			1850 x 1800 x 760			1850 x 2000 x 760	
Weight							
Machine - D		kg	785	825	850	1180	1275
- DQ		kg	805	850	870	1220	1315
- DSQ		kg	840	885	905	1255	1345
Operating- D		kg	790	830	860	1190	1290
- DQ		kg	810	855	880	1230	1325
- DSQ		kg	845	890	915	1265	1360
Construction - Material / Colour			Plain Galvanised Steel Base with Galvanised Sheet Steel, Epoxy Baked Powder Paint Superstructure– Light Grey (RAL 7035)				
Evaporator			Brazed Plate Class 0				
Insulation							
Water Volume		l	3.7	5.1	9.4	11.0	12.3
Total Max. Water Flow		l/s	6.1	8.2	10.5	12.7	14.7
Compressor			Tandem Scroll – Hermetic				
Quantity			4	4	4	4	4
Oil Charge Volume (Total)		l	4 x 4.1	4 x 4.1	4 x 4.1	4 x 4.1	4.7 + 4.1 + 4.7 + 4.1
Oil Type			Polyol Ester				
Refrigeration			Dual Circuit				
Refrigerant Control			Electronic Expansion Valve				
Refrigerant Type			R407C				
Holding Charge			Dry Nitrogen				
Connections - Evaporator			Suits "Victaulic" type Coupling & Pipe Assembly				
Water Inlet / Outlet		mm / (in)	50 (2")	50 (2")	65 (2 1/2")	65 (2 1/2")	65 (2 1/2")
Connections – Condenser							
Discharge Line (brazed)		in	1 1/8	1 1/8	1 3/8	1 5/8	1 5/8
Liquid Line (brazed)		in	7/8	7/8	1 1/8	1 3/8	1 3/8
Water System – Evaporator							
Min. System Water Volume	(3)	l	358	489	625	755	696
Max. System Press		Bar	10	10	10	10	10

- (1) Nominal Cooling Duties based on 12/7°C water temperature and 45°C dew point, where output is the chilled water duty and input is the compressor input power.
All performance data is supplied in accordance with BS EN 14511-1:2013
- (2) EER is the Cooling Duty ÷ compressor input power.
- (3) For minimum system volume refer to **Minimum System Water Volume Calculations**.

General Specification

MECHANICAL DATA			URAC200	URAC225	URAC240	URAC250	URAC270
Duty – Cooling							
Cooling Only	(1)	kW	209.2	236.3	248.2	289.5	289.5
Nominal Input	(1)	kW	54.9	62.5	70.1	80.7	80.7
EER	(2)		3.8	3.7	3.5	3.7	3.6
Capacity Steps		%	0-25-50-75-100	0-20-30-50-70-80-100	0-17-33-50-67-83-100	0-25-50-75-100	0-19-33-52-67-86-100
Dimensions - H x L x W	(5)	mm	1850 x 2000 x 760		1900 x 3200 x 900	1850 x 2000 x 760	1900 x 3200 x 900
Weight							
Machine - D		kg	1365	1425	1210	1495	1500
- DQ		kg	1405	1465	1280	1530	1570
- DSQ		kg	1440	1500	1300	1565	1590
Operating- D		kg	1380	1450	1230	1520	1530
- DQ		kg	1420	1490	1300	1555	1600
- DSQ		kg	1455	1525	1320	1590	1620
Construction - Material / Colour			Plain Galvanised Steel Base with Galvanised Sheet Steel, Epoxy Baked Powder Paint Superstructure– Light Grey (RAL 7035)				
Evaporator			Braze Plate Class 0				
Insulation							
Water Volume		l	14.6	22.1	21.6	24.8	26.1
Total Max. Water Flow		l/s	16.8	19.0	17.2	21.3	20.1
Compressor			Tandem Scroll - Hermetic				
Quantity			4	4	6	4	6
Oil Charge Volume (Total)		l	4.7 + 4.7 + 4.7 + 4.7	6.3 + 4.7 + 6.3 + 4.7	6 x 3.4	6.3 + 6.3 + 6.3 + 6.3	4.7+4.7+4.7+3.4 +3.4+3.4
Oil Type			Polyol Ester				
Refrigeration			Dual Circuit				
Refrigerant Control			Electronic Expansion Valve				
Refrigerant Type			R407C				
Holding Charge			Dry Nitrogen				
Connections - Evaporator			Suits "Victaulic" type Coupling & Pipe Assembly				
Water Inlet / Outlet		mm / (in)	65 (2 1/2")	80 (3")	80 (3")	80 (3")	80 (3")
Connections – Condenser – CCT1							
Discharge Line (Brazed)		in	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8
Liquid Line (Brazed)		in	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Connections – Condenser – CCT2							
Discharge Line (Brazed)		in	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8
Liquid Line (Brazed)		in	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Water System - Evaporator							
Min. System Water Volume	(3)	l	991	890	763	1235	995
Max. System Press		Bar	10	10	10	10	10

- (1) Nominal Cooling Duties based on 12/7°C water temperature and 45°C dew point, where output is the chilled water duty and input is the compressor input power.
All performance data is supplied in accordance with BS EN 14511-1:2013
- (2) EER is the Cooling Duty ÷ compressor input power.
- (3) For minimum system volume refer to **Minimum System Water Volume Calculations**.

General Specification

MECHANICAL DATA

			URAC300	URAC330	URAC360	URAC400	URAC450
Duty – Cooling							
Cooling Only	(1)	kW	331.5	373.3	415.8	459.0	502.4
Nominal Input	(1)	kW	91.3	102.8	114.4	128.7	143.1
EER	(2)		3.6	3.6	3.6	3.6	3.5
Capacity Steps		%	0-17-33-50-67-83-100	0-19-33-52-67-85-100	0-17-33-50-67-83-100	0-18-33-51-67-85-100	0-17-33-50-67-83-100
Dimensions - H x L x W			(5) mm	1900 x 3200 x 900	1900 x 3200 x 900	1900 x 3200 x 900	1900 x 3200 x 900
Weight							
Machine - D		kg	1790	1860	1940	2070	2210
- DQ		kg	1860	1930	2010	2140	2280
- DSQ		kg	1880	1950	2030	2160	2300
Operating - D		kg	1820	1900	1980	2120	2280
- DQ		kg	1900	1960	2060	2180	2340
- DSQ		kg	1900	2000	2060	2220	2360
Construction - Material / Colour			Plain Galvanised Steel Base with Galvanised Sheet Steel, Epoxy Baked Powder Paint Superstructure– Light Grey (RAL 7035)				
Evaporator			Brazed Plate Class 0				
Insulation							
Water Volume		l	30.6	35.1	39.6	46.8	55.8
Total Max. Water Flow		l/s	23.1	26.1	29.2	32.1	34.9
Compressor			Trio Scroll - Hermetic				
Quantity			6	6	6	6	6
Oil Charge Volume (Total)		l	6 x 4.7	6.3+6.3+6.3+4.7 +4.7+4.7	6 x 6.3	5.9+5.9+5.9+6.3 +6.3+6.3	6 x 5.9
Oil Type			Polyol Ester				
Refrigeration			Dual Circuit				
Refrigerant Control			Electronic Expansion Valve				
Refrigerant Type			R407C				
Holding Charge			Dry Nitrogen				
Connections - Evaporator			Suits "Victaulic" type Coupling & Pipe Assembly				
Water Inlet / Outlet		mm / (in)	80 (3")	80 (3")	80 (3")	80 (3")	80 (3")
Connections – Condenser – CCT1							
Discharge Line (Brazed)		in	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8
Liquid Line (Brazed)		in	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8
Connections – Condenser – CCT2							
Discharge Line (Brazed)		in	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8
Liquid Line (Brazed)		in	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8
Water System - Evaporator							
Min. System Water Volume	(3)	l	1029	1289	1286	1498	1539
Max. System Press		Bar	10	10	10	10	10

(1) Nominal Cooling Duties based on 12/7°C water temperature and 45°C dew point, where output is the chilled water duty and input is the compressor input power.

All performance data is supplied in accordance with BS EN 14511-1:2013

(2) EER is the Cooling Duty ÷ compressor input power.

(3) For minimum system volume refer to **Minimum System Water Volume Calculations**.

General Specification

ELECTRICAL DATA			URAC75	URAC100	URAC125	URAC150	URAC175
Unit Data							
Nominal Run Amps	(1)	A	47	58	74	90	103
Maximum Start Amps	(2)	A	1363	164	226	242	289
Permanent Supply		VAC			230V 1PH 50Hz		
Mains Supply		VAC			400V 3PH 50Hz		
Rec Permanent Fuse Size		A	16	16	16	16	16
Rec Mains Fuse Size		A	63	80	100	125	125
Max Permanent Incoming Cable Size		mm ²			4 mm ² terminals		
Max Mains Incoming Cable Size		mm ²			70 (direct to MCCB)		
Control Circuit		VAC			24V/230VAC		
Evaporator							
Pad Heater Rating		W	40	40	40	80	100
External Trace Heating							
Available (fitted by others)		W	500	500	500	500	500
Compressor - Per Compressor							
Quantity			4	4	2+2	4	2+2
Motor Rating		kW	6.2	8.1	8.1/12.3	12.3	12.3/16.8
Nominal Run Amps	(1)	A	11.7	14.5	14.5/22.4	22.4	22.4/28.9
Crankcase Heater Rating		W	70.0	70.0	70.0/70	70.0	70.0/120.0
Start Amps	(2)		98	120	120/175	175	175/215
Type Of Start					Direct on line		
OPTIONAL EXTRAS							
Power Factor Correction							
Nominal Run Amps	(1)	A	40	52	66	72	92
Maximum Start Amps	(2)	A	128	159	221	235	281
Recommended Mains Fuse		A	63	80	100	100	125
Compressor Nominal Run Amps - Per Compressor			10	13	13.0/20.0	20	20/26
Electronic Soft-Start							
Nominal Run Amps	(1)	A	47	58	74	80	103
Maximum Start Amps	(2)	A	94	116	156	172	203
Recommended Mains Fuse		A	63	80	100	125	125

(1) Based at 12/7°C evaporator water and 30/35°C condenser water.

(2) Starting amps refers to the direct on line connections.

General Specification

ELECTRICAL DATA			URAC200	URAC225	URAC240	URAC250	URAC270
Unit Data							
Nominal Run Amps	(1)	A	116	129	149	142	155
Maximum Start Amps	(2)	A	350	363	299	377	355
Permanent Supply		VAC			230V 1PH 50Hz		
Mains Supply		VAC			400V 3PH 50Hz		
Rec Permanent Fuse Size		A	16	16	16	16	16
Rec Mains Fuse Size		A	160	160	200	200	200
Max Permanent Incoming Cable Size		mm ²			4 mm ² terminals		
Max Mains Incoming Cable Size		mm ²			70 (direct to MCCB)		
Control Circuit		VAC			24V/230VAC		
Evaporator							
Pad Heater Rating		W	100	100	100	100	100
External Trace Heating							
Available (fitted by others)		W	500	500	500	500	500
Compressor - Per Compressor							
Quantity			2+2	2+2	3+3	2+2	3+3
Motor Rating		kW	12.3/20.6	14.4/20.6	12.3/12.3	20.6/20.6	12.3/14.4
Nominal Run Amps	(1)	A	22.4/35.6	25.2/35.6	24.9/24.9	35.6/35.6	24.9/25.2
Crankcase Heater Rating		W	120/150	120/150	N/A	150/150	N/A
Start Amps	(2)		175/270	225/270	174/174	270/270	174/225
Type Of Start					Direct on line		
OPTIONAL EXTRAS							
Power Factor Correction							
Nominal Run Amps	(1)	A	104	116	134	128	134
Maximum Start Amps	(2)	A	342	354	286	366	337
Recommended Mains Fuse		A	125	160	200	200	200
Compressor Nominal Run Amps - Per Compressor		A	20/32	22.5/28.8	22.3/22.3	32/32	22.3/22.5
Electronic Soft-Start							
Nominal Run Amps	(1)	A	116	129	149	142	155
Maximum Start Amps	(2)	A	242	255	229	258	280
Recommended Mains Fuse		A	160	160	200	200	200

- (1) Based at 12/7°C evaporator water and 30/35°C condenser water.
 (2) Starting amps refers to the direct on line connections.

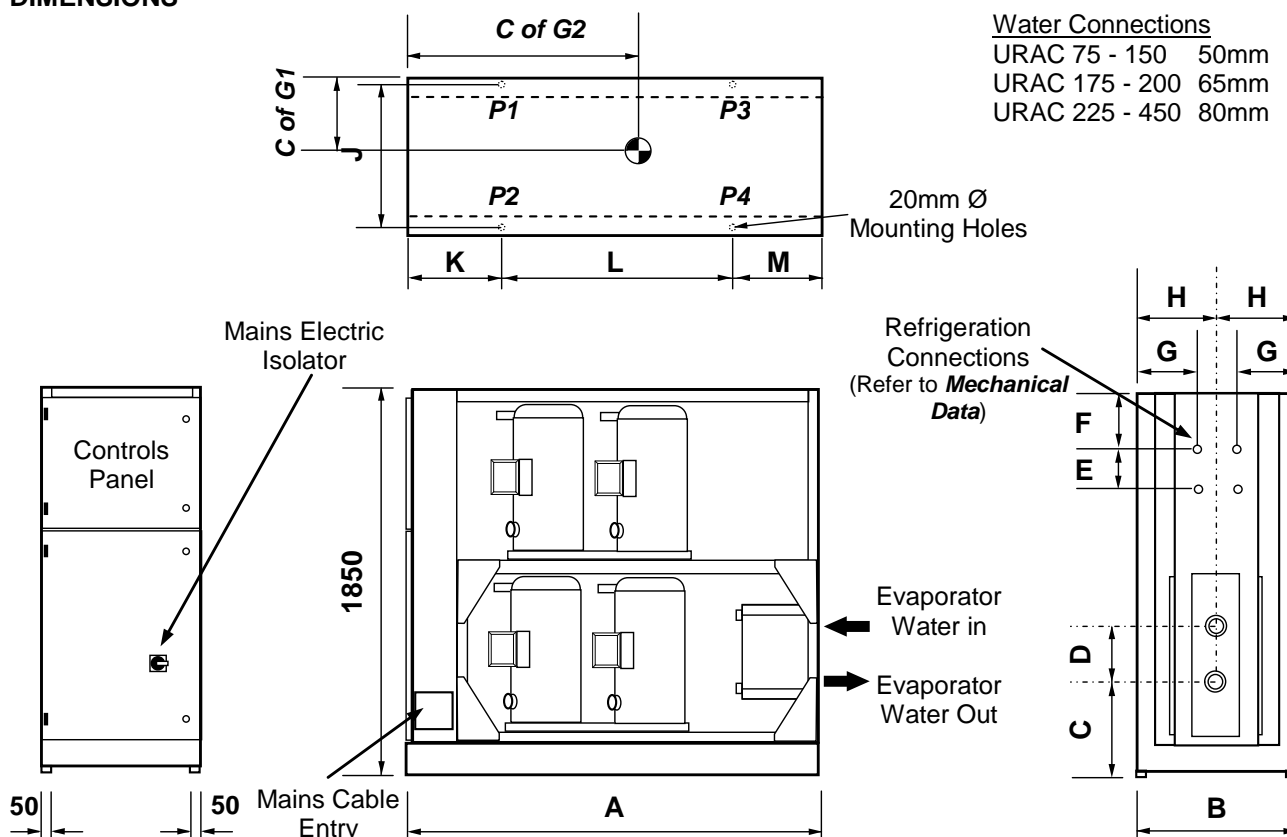
General Specification

ELECTRICAL DATA			URAC300	URAC330	URAC360	URAC400	URAC450
Unit Data							
Nominal Run Amps	(1)	A	151	172	193	218	242
Maximum Start Amps	(2)	A	376	412	433	497	522
Permanent Supply		VAC			230V 1PH 50Hz		
Mains Supply		VAC			400V 3PH 50Hz		
Rec Permanent Fuse Size		A	16	16	16	16	16
Rec Mains Fuse Size		A	200	250	250	315	315
Max Permanent Incoming Cable Size		mm ²			4 mm ² terminals		
Max Mains Incoming Cable Size		mm ²			70 (direct to MCCB)		
Control Circuit		VAC			24V/230VAC		
Evaporator							
Pad Heater Rating		W	100	100	100	100	100
External Trace Heating							
Available (fitted by others)		W	500	500	500	500	500
Compressor - Per Compressor							
Quantity			3+3	3+3	3+3	3+3	3+3
Motor Rating		kW	14.4/14.4	20.6/14.4	20.6/20.6	22.5/20.6	22.5/22.5
Nominal Run Amps	(1)	A	25.2/25.2	35.6/25.2	35.6/35.6	40.3/35.6	40.3/40.3
Crankcase Heater Rating		W	N/A	N/A	N/A	N/A	N/A
Start Amps	(2)		225/225	272/225	272/272	320/272	320/320
Type Of Start					Direct on line		
OPTIONAL EXTRAS							
Power Factor Correction							
Nominal Run Amps	(1)	A	135	154	173	195	217
Maximum Start Amps	(2)	A	338	397	416	479	501
Recommended Mains Fuse		A	200	250	250	315	315
Compressor Nominal Run Amps - Per Compressor		A	22.5/22.5	28.8/22.5	28.8/28.8	36.1/28.8	36.1/36.1
Electronic Soft-Start							
Nominal Run Amps	(1)	A	141	180	201	228	252
Maximum Start Amps	(2)	A	234	303	324	369	394
Recommended Mains Fuse		A	200	250	250	315	315

- (1) Based at 12/7°C evaporator water and 30/35°C condenser water.
 (2) Starting amps refers to the direct on line connections.

General Specification

DIMENSIONS



Model Size		A	B	C	D	E	F	G	H	J	K	L	M
URAC75	mm	1800	760	397	369	200	220	280	380	710	462	876	462
URAC100	mm	1800	760	397	369	200	220	280	380	710	462	876	462
URAC125	mm	1800	760	397	369	200	220	280	380	710	462	876	462
URAC150	mm	2000	760	394	369	200	220	280	380	710	462	1076	462
URAC175	mm	2000	760	394	369	200	220	280	380	710	462	1076	462
URAC200	mm	2000	760	394	369	200	220	280	380	710	462	1076	462
URAC225	mm	2000	760	298	568	200	220	280	380	710	462	1076	462
URAC240	mm	3200	900	256	628	500	250	250	450	850	970	1730	500
URAC250	mm	2000	760	298	568	200	220	280	380	710	462	1076	462
URAC300	mm	3200	900	256	628	500	250	250	450	850	970	1730	500
URAC330	mm	3200	900	256	628	500	250	250	450	850	970	1730	500
URAC360	mm	3200	900	256	628	500	250	250	450	850	970	1730	500
URAC400	mm	3200	900	256	628	500	250	250	450	850	970	1730	500
URAC450	mm	3200	900	256	628	500	250	250	450	850	970	1730	500

General Specification

POINT LOADINGS, WEIGHTS & CENTRE OF GRAVITY (C OF G)

Model D		P1	P2	P3	P4	Operating Weight	C of G1 (m)	C of G2 (m)
URAC75D	kg	165	165	230	230	790	380	710
URAC100D	kg	175	175	240	240	830	380	710
URAC125D	kg	180	180	250	250	860	380	710
URAC150D	kg	255	255	340	340	1190	380	820
URAC175D	kg	275	275	370	370	1290	380	820
URAC200D	kg	300	300	390	390	1380	380	820
URAC225D	kg	315	315	410	410	1450	380	820
URAC240D	kg	560	560	210	210	1230	1442	450
URAC250D	kg	330	330	430	430	1520	380	820
URAC270D	kg	610	610	230	230	1530	1444	450
URAC300D	kg	660	660	250	250	1820	1445	450
URAC330D	kg	680	680	270	270	1900	1462	450
URAC360D	kg	710	710	280	280	1980	1459	450
URAC400D	kg	750	750	310	310	2120	1476	450
URAC450D	kg	800	800	340	340	2280	1486	450

Model DQ		P1	P2	P3	P4	Operating Weight	C of G1 (m)	C of G2 (m)
URAC75DQ	kg	170	170	235	235	810	380	360
URAC100DQ	kg	180	180	248	248	855	380	710
URAC125DQ	kg	190	190	250	250	880	380	360
URAC150DQ	kg	260	260	355	355	1230	380	420
URAC175DQ	kg	285	285	378	378	1325	380	420
URAC200DQ	kg	305	305	405	405	1420	380	820
URAC225DQ	kg	325	325	420	420	1490	380	420
URAC240DQ	kg	580	580	230	230	1300	1461	450
URAC250DQ	kg	340	340	438	438	1555	380	820
URAC270DQ	kg	630	630	250	250	1600	1461	450
URAC300DQ	kg	680	680	270	270	1900	1462	450
URAC330DQ	kg	700	700	280	280	1960	1464	450
URAC360DQ	kg	730	730	300	300	2060	1474	450
URAC400DQ	kg	770	770	320	320	2180	1478	450
URAC450DQ	kg	820	820	350	350	2340	1488	450

Model DSQ		P1	P2	P3	P4	Operating Weight	C of G1 (m)	C of G2 (m)
URAC75DSQ	kg	175	175	248	248	845	380	710
URAC100DSQ	kg	190	190	255	255	890	380	700
URAC125DSQ	kg	195	195	263	263	915	380	710
URAC150DSQ	kg	270	270	363	363	1265	380	820
URAC175DSQ	kg	290	290	390	390	1360	380	820
URAC200DSQ	kg	310	310	418	418	1455	380	820
URAC225DSQ	kg	330	330	433	433	1525	380	820
URAC240DSQ	kg	580	580	230	230	1320	1461	450
URAC250DSQ	kg	345	345	450	450	1590	380	820
URAC270DSQ	kg	630	630	260	260	1620	1475	450
URAC300DSQ	kg	680	680	270	270	1900	1462	450
URAC330DSQ	kg	710	710	290	290	2000	1472	450
URAC360DSQ	kg	730	730	300	300	2060	1474	450
URAC400DSQ	kg	780	780	330	330	2220	1484	450
URAC450DSQ	kg	820	820	360	360	2360	1498	450

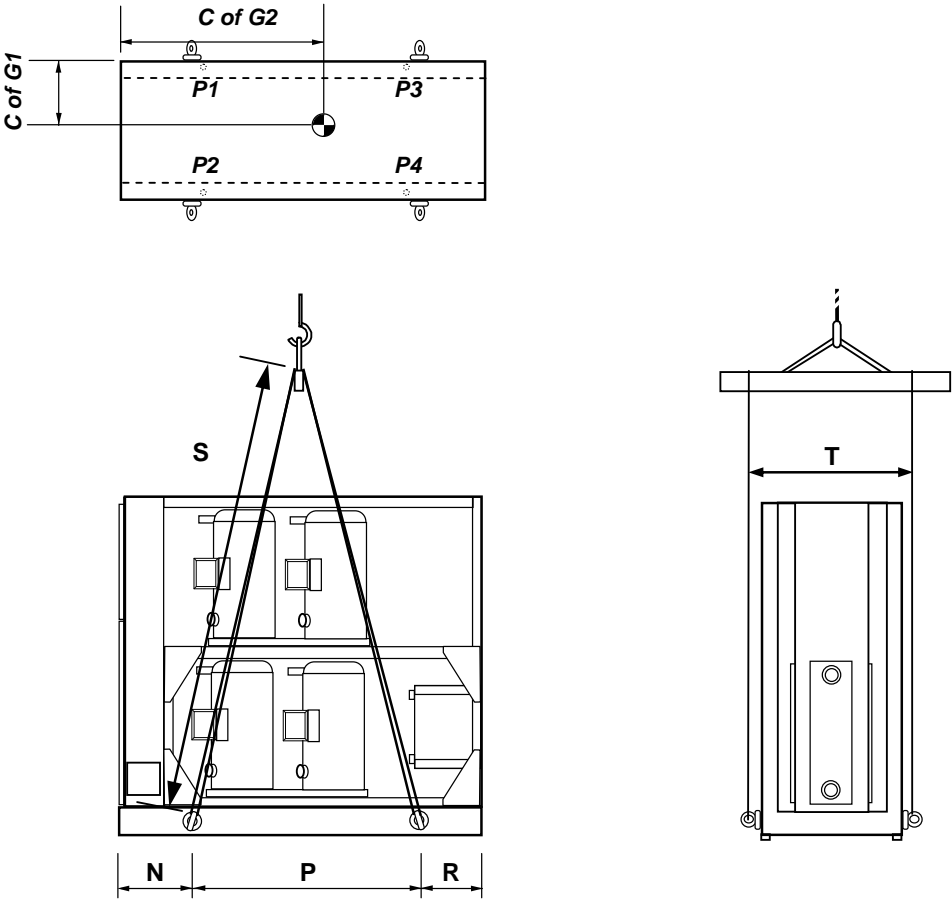
1 For C of G diagram refer to **Unit Lifting**.

Installation Data

- UNIT LIFTING
- Employ lifting specialists.
 - Local codes and regulations relating to the lifting of this type of equipment should be observed.
 - Use the lifting eye bolts provided.
 - Use the appropriate spreader bars/lifting slings with the holes/lugs provided.
 - Attach lifting chains to the 4 lifting eye bolts, each chain and eye bolt must be capable of lifting the whole chiller.
 - Lift the unit slowly and evenly.
 - If the unit is dropped, it should immediately be checked for damage and reported to Airedale Service.

CAUTION  Only use lifting points provided.

The unit should be lifted from the base and where possible, with all packing and protection in position. If any other type of slinging is used, due care should be taken to ensure that the slings do not crush the casework or coil.



LIFTING DIMENSIONS


		N	P	R	S	T
URAC 75 - 125	mm	370	1060	370	2100	850
URAC 150 - 250	mm	370	1260	370	2100	850
URAC 240 - 450	mm	885	1900	415	2100	990

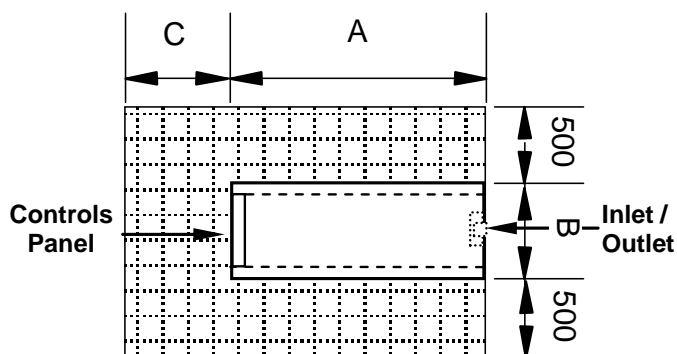
Installation Data

POSITIONING

The installation position should be selected with the following points in mind:

- Position on a stable and even base, levelled to ensure that the compressor operates correctly.
- Levelling should be to +/- 5mm
- Where vibration transmission to the building structure is possible, fit spring anti-vibration mounts and flexible water connections.
- Observe airflow and maintenance clearances.
- Pipework and electrical connections are readily accessible.
- Where multiple units are installed, due care should be taken to avoid the discharge air from each unit adversely affecting other units in the vicinity.

CAUTION  Prior to connecting services, ensure that the equipment is installed and completely level.



Model Size		A	B	C
URAC75 – URAC125	mm	1800	760	760
URAC150 – URAC250 (Ex. 240)	mm	2000	760	760
URAC240 – URAC450 (Ex. 250)	mm	3200	900	900

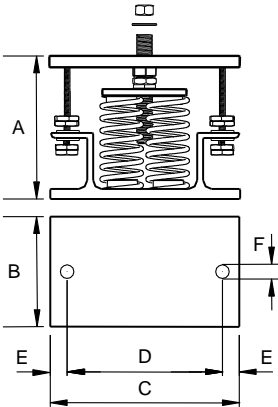
Installation Data

ANTI VIBRATION MOUNTING (OPTIONAL)

Spring Type

Each mount is coloured to indicate the different loads, refer to instructions supplied for correct allocation.

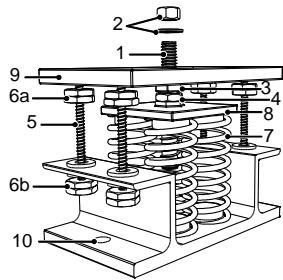
Dimensions



	A ⁽¹⁾	B	C	D	E	FØ
4 Spring (mm)	162	130	225	186	20	16

(1) Unloaded dimension

Components



1

Locating Screw

2

Retaining Nut & Washer

3

Levelling Screw

4

Levelling Lock Nut

5

Retaining Studs

6a

Upper Retaining Nuts

6b

Lower Retaining Nuts

7

Spring assembly

8

Pressure Plate

9

Top Plate

10

Bolting-down holes

- Installation
- 1

Locate and secure mount using bolting down holes (10) in base plate.
- 2

Ensure mounts are located in line with the unit base.
- 3

If applicable, remove compressor enclosure covers to allow access to mount fixing holes in the unit base.
- 4

Lock the upper retaining nuts (6a) to the underside of the top plate (9) before a load is applied.
- 5

Slacken levelling lock nut (4). (the levelling screw will not move if this is not slackened)
- 6

Remove retaining nut and washer (2), lower the unit onto the mounts and replace retaining nut and washer.
- 7

Beginning with the mount with the largest deflection adjust the height of each mount using the levelling screw (3).

CAUTION



Mountings must be adjusted incrementally in turn. Do not fully adjust 1 mount at a time as this may overload and damage springs.

- 7

When all mounts are level, lock each into place using the levelling lock nut (4).
- 8

Lock all retaining nuts (6a and 6b) to the extreme ends of the retaining studs (5).

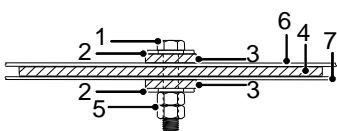
CAUTION



Do not connect any services until all anti vibration mounts have been fully adjusted.

Pad Type

Components/Installation



1

M16 Bolt (Not Supplied)

2

Washer (Not Supplied)

3

Fixing Pad 506-063

4

A V Pad 506-062

5

2 x M16 Nut (Not Supplied)

6

Unit Base

7


Unit Mounting Plinth

Installation Data

WATER SYSTEM

Chilled water pipework and ancillary components must be installed in accordance with:

- National and Local Water supply company standards.
- The manufacturer's instructions are followed when fitting ancillary components.
- The system water is treated to prevent corrosion and algae forming.
- In ambients of 0°C and below and when water supply temperatures of +5°C are required, the necessary concentration of Glycol or use of an electrical trace heater is added where static water can be expected.
- The schematic is referred to as a guide to ancillary recommendations.

CAUTION  The unit water connections are **NOT** designed to support external pipework, pipework should be supported during installation.

The water flow commissioning valve set is not shown in the diagram, as the valve can be fitted elsewhere within the chilled water circuit.

Component Recommended Requirements

The recommended requirements to allow commissioning to be carried out correctly are:

- The inclusion of Binder Points adjacent to the flow and return connections, to allow temperature and pressure readings.
- A flow switch or equivalent, fitted adjacent to the water outlet side of the Chiller.

CAUTION  The correct operation of the flow switch is critical if the chiller warranty is to be valid.

- A 20 mesh strainer fitted prior to the evaporator inlet.
- A water-flow commissioning valve set fitted to the system.
- In multiple chiller installations, 1 commissioning valve set is required per chiller
- Air vents are to be installed at all high points and where air is likely to be trapped at intermediate points.
- Drain points are to be installed at all low points in the system and in particular adjacent to the unit for maintenance to be carried out.
- Isolating valves should be installed adjacent to all major items of equipment for ease of maintenance.
- Balancing valves can be installed if required to aid correct system balancing.
- All chilled water pipework must be insulated and vapour sealed to avoid condensation.
- If several units are installed in parallel adjacent to each other, reverse return should be applied to avoid unnecessary balancing valves.

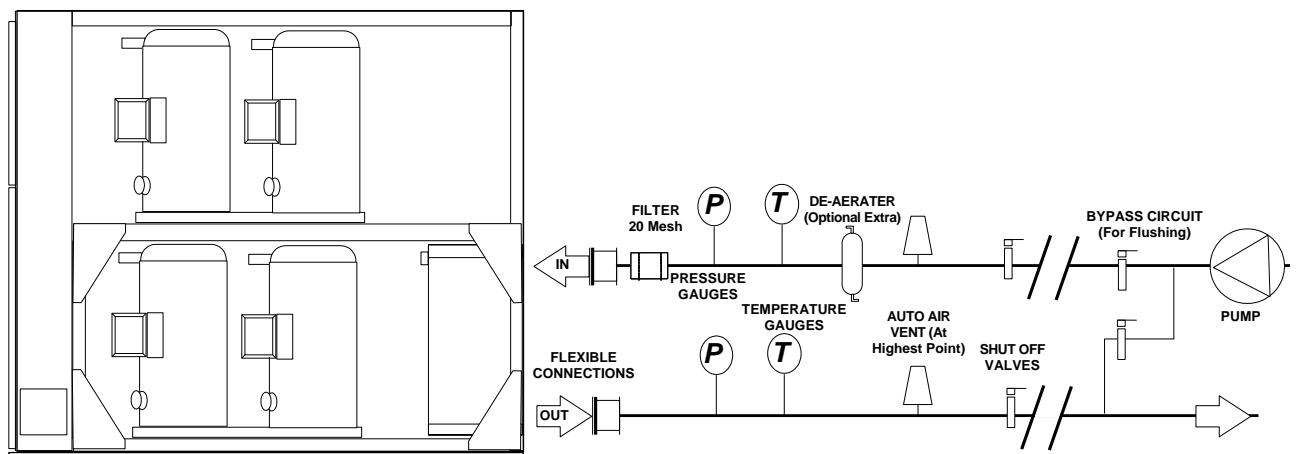
Interlocks & Protection

Always electrically interlock the operation of the chiller with the pump controls **and** water flow switch for safety reasons. **Failure to do this will invalidate the chiller warranty.**

CAUTION  Do not rely solely on the BMS to protect the chiller against low flow conditions.

An evaporator pump interlock and flow switch **MUST** be directly wired to the chiller, refer to **Interconnecting Wiring** diagram.

Standard Recommended Installation (Parts Supplied By Others)



Installation Data


ELECTRICAL

General

- As standard the equipment is designed for 400V, 3 phase, 3 wire 50Hz and a separate permanent 230V, 1 phase, 50Hz supply, to all relevant IEE regulations, British standards and IEC requirements.
- A fused and isolated electrical supply of the appropriate phase, frequency and voltage should be installed.
- The control voltage to the interlocks is 24V. Always size the low voltage interlock and protection cabling for a maximum voltage drop of 2V.

CAUTION  **Wires should be capable of carrying the maximum load current under non-fault conditions at the stipulated voltage.**

- Avoid large voltage drops on cable runs, particularly low voltage wiring.

CAUTION  **A separately fused, locally isolated, permanent single phase and neutral supply MUST BE FITTED for the compressor sump heater, evaporator trace heating and control circuits, FAILURE to do so could INVALIDATE WARRANTY.**

INTERCONNECTING WIRING

URAC75 - URAC450	L1	○	←	Mains incoming supply 400V/3PH/50Hz
	L2	○	←	
	L3	○	←	
	E	○	←	
	L4	○	←	Separate Permanent Supply 230V/1PH/50Hz
	N1	○	←	
	E	○	←	
	2	○	→	External Trace Heater Connections 240V/500W max.
	N	○	←	
	502	○	→	(1) Evaporator Pump Interlock 24VAC
	503	○	←	
	504	○	←	(1) Evaporator Pump Water Flow Switch 24VAC
	506	○	→	
	502	○	→	Unit Remote On/Off 24VAC
	505	○	←	
	502	○	→	Setback Setpoint Temperature switch
	507	○	←	
	502	○	→	Remote Pump Interlock 24VAC
	522	○	←	
	573	○	←	Circuit 1 Volt Free Common Alarm Volt Free Alarm N/O Volt Free Alarm N/C
	574	○	→	
	575	○	→	
	576	○	←	Circuit 2 Volt Free Common Alarm Volt Free Alarm N/O Volt Free Alarm N/C
	577	○	→	
	578	○	→	
	RX-	○		pLan Network Connections
	RX+	○		
	GND	○		

CAUTION  **(1) MUST be directly wired to the chiller to validate warranty.**

pLAN Termination



The equipment contains live electrical and moving parts, ISOLATE prior to maintenance or repair work.



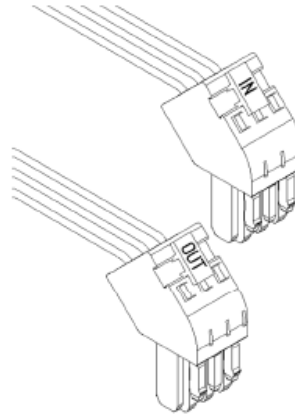
ALL work MUST be carried out by technically trained competent personnel.

Airedale International Air Conditioning Ltd

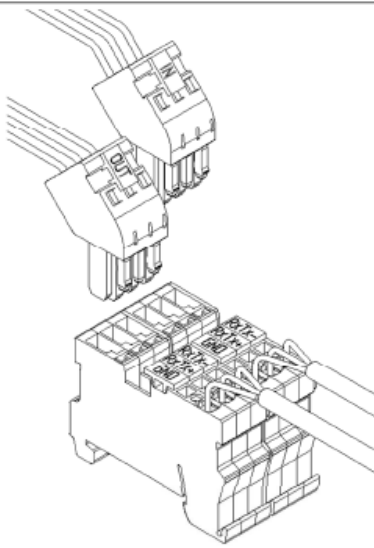
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APPLIED THERMAL INNOVATION

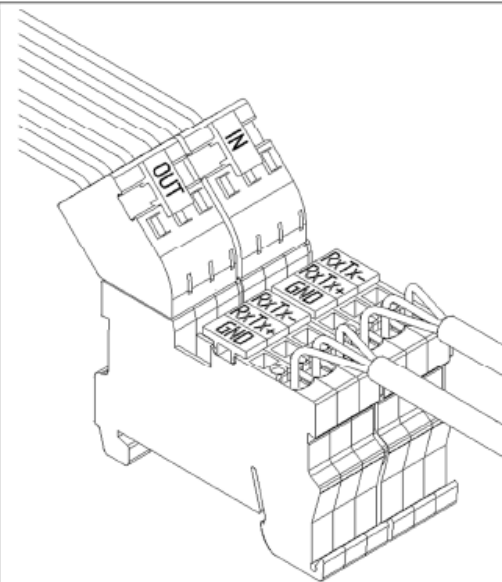
1. Disconnect power to the control circuit before wiring the pLAN connection.



2. Remove the plugs from the bag and wire the pLAN connections to them. Check the correct orientation of the connections against the terminal labels and wiring diagram. Ensure the other end of the pLAN cable is also correctly terminated.



3. Check wiring to ensure no shorts or incorrect connections before connecting to the unit. Failure to do so may cause serious damage to electrical components.



4. Plug the pLAN connectors into the terminals. The control circuit power can then be reconnected.

Condenser Specification

GENERAL SPECIFICATION

Remote Air Cooled Chiller		URAC75	URAC100	URAC125	URAC150	URAC175
Matched Condenser – Per Unit		CE75 x 2	CE100 x 2	CE125 x 2	CE150 x 2	CE175 x 2
Sound Data						
Sound Pressure Level at 10m	dB(A)	49	56	52	57	56
Mechanical Data						
Dimensions						
Horizontal - H x L x W	mm	1168 x 2425 x 630	1168 x 2425 x 630	1168 x 4625 x 630	1168 x 3525 x 630	1383 x 4753 x 795
Vertical - H x L x W	mm	1020 x 2425 x 1098	1020 x 2425 x 1098	1020 x 4625 x 1098	1020 x 3525 x 1098	1335 x 4753 x 1272
Weight - Machine	kg	177	177	320	253	302
Construction - Material / Colour		Painted Galvanised Steel – Light Grey (RAL 9002)				
Condenser Coil						
Quantity		2	2	4	3	1
Nominal Airflow	m³/s	4.67	7.72	9.76	11.58	16.80
Discharge		Vertical or Horizontal				
Fan & Motor						
Quantity		2	2	4	3	3
Diameter	mm	630	630	630	630	800
Maximum Speed	rpm	970	1380	970	1380	890
Connections						
Discharge	in	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8
Liquid	in	1 1/8	1 3/8	1 5/8	1 5/8	1 5/8
Electrical Data						
Nominal Run Amps	A	2.4	6.2	4.8	9.3	12.0

Remote Air Cooled Chiller		URAC200	URAC225	URAC240	URAC250	URAC270
Matched Condenser – Per Unit		CE200 x 2	CE225 x 2	CE240 x 2	CE250 x 2	CE240 & CE300
Sound Data						
Sound Pressure Level at 10m	dB(A)	56	56	56	49	56 & 57
Mechanical Data						
Dimensions						
Horizontal - H x L x W -	mm	1383 x 4753 x 795	1383 x 4753 x 795	1383 x 4753 x 795	1383 x 6228 x 795	1383 x 4753 x 795 & 1383 x 6228 x 878
Vertical - H x L x W	mm	1335 x 4753 x 1272	1335 x 4753 x 1272	1335 x 4753 x 1272	1335 x 6228 x 1272	1335 x 4753 x 1272 & 1335 x 6228 x 1272
Weight - Machine	kg	470	470	497	497	497 & 646
Construction - Material / Colour		Painted Galvanised Steel – Light Grey (RAL 9002)				
Condenser Coil						
Quantity		1	1	1	1	1 & 1
Nominal Airflow	m³/s	16.25	16.25	15.55	12.31	15.55 & 20.73
Discharge		Vertical or Horizontal				
Fan & Motor						
Quantity		3	3	3	3	3 & 4
Diameter	mm	800	800	800	800	800 & 800
Maximum Speed	rpm	890	890	890	890	890 & 890
Connections						
Discharge	in	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8 & 2 5/8
Liquid	in	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8 & 2 1/8
Electrical Data						
Nominal Run Amps	A	12.0	12.0	12.0	7.2	12.0 & 16.0

- (1) Standard unit match based on 12/7°C chilled water, 45°C dew point condensing temperature, 30° ambient. For alternative conditions, please contact Airedale.

Condenser Specification

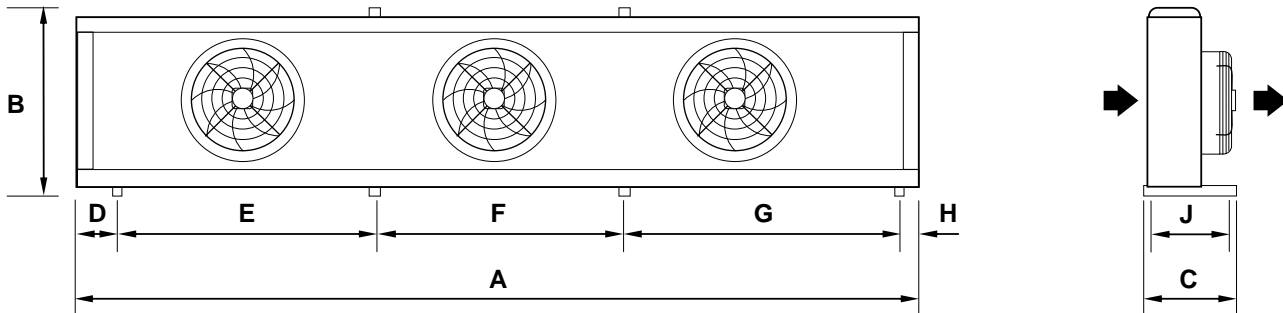
GENERAL SPECIFICATION

Remote Air Cooled Chiller		URAC300	URAC330	URAC360	URAC400	URAC450
Matched Condenser – Per Unit		CE300 x 2	CE300 & CE360	CE360 x 2	CE360 & CE450	CE450 x 2
Sound Data						
Sound Pressure Level at 10m	dB(A)	57	57 & 59	59	59 & 59	59 & 59
Mechanical Data						
Dimensions						
Horizontal - H x L x W -	mm	1383 x 6228 x 795	1383 x 6228 x 795 & 2436 x 4783 x 878	2436 x 4783 x 878	2436 x 4783 x 878 & 2436 x 4783 x 878	2436 x 4783 x 878
Vertical - H x L x W	mm	1335 x 6228 x 1272	1335 x 6228 x 1272 & 1335 x 4783 x 2436	1335 x 4783 x 2436	1335 x 4783 x 2436 & 1335 x 4783 x 2436	1335 x 4783 x 2436
Weight - Machine	kg	646	646 & 860	860	860 & 860	860 & 860
Construction - Material / Colour		Painted Galvanised Steel – Light Grey (RAL 9002)				
Condenser Coil						
Nominal Airflow	m³/s	20.7	20.7 & 32.0	32.0	32.0 & 32.0	32.0 & 32.0
Discharge			Vertical or Horizontal			
Fan & Motor						
Quantity		4	4 & 6	6	6 & 6	6 & 6
Diameter	mm	800	800 & 800	800	800 & 800	800 & 800
Maximum Speed	rpm	890	890 & 890	890	890 & 890	890 & 890
Connections						
Discharge	in	2 5/8	2 5/8 & 2 x 2 5/8	2 x 2 5/8	2 x 2 5/8 & 2 x 2 5/8	2 x 2 5/8 & 2 x 2 5/8
Liquid	in	2 1/8	2 1/8 & 2 x 2 1/8	2 x 2 1/8	2 x 2 1/8 & 2 x 2 1/8	2 x 2 1/8 & 2 x 2 1/8
Electrical Data						
Nominal Run Amps	A	16.0	16.0 & 24.0	24.0	24.0 & 24.0	24.0 & 24.0

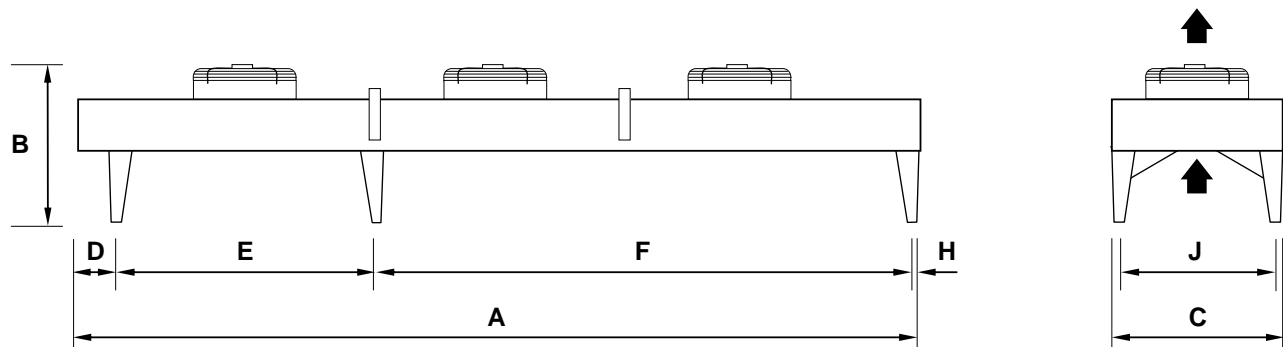
- (1) Nominal Cooling Duties based on 12/7°C chilled water temperature, 45°C saturation temperature and 30°C outside temperature. For information on other conditions, please contact Airedale.

Condenser Installation Data

DIMENSIONS



HORIZONTAL		A	B	C	D	E	F	G	H	J
CE75-H	mm	2425	1168	630	183	2173	N/A	N/A	69	492
CE100-H	mm	2425	1168	630	183	2173	N/A	N/A	69	492
CE125-H	mm	4625	1168	630	183	2186	N/A	2187	69	492
CE150-H	mm	3525	1168	630	183	1086	N/A	2187	69	492
CE175-H	mm	4753	1383	795	293	1450	1475	1450	85	745
CE200-H	mm	4753	1383	795	293	1450	1475	1450	85	745
CE225-H	mm	4753	1383	795	293	1450	1475	1450	85	745
CE240-H	mm	4753	1383	795	293	1450	1475	1450	85	745
CE250-H	mm	6228	1383	795	293	1450	2 x 1475	1450	85	745
CE300-H	mm	6228	1383	795	293	1450	2 x 1475	1450	85	745
CE360-H	mm	4783	2436	878	323	1450	1475	1450	85	828
CE450-H	mm	4783	2436	878	323	1450	1475	1450	85	828



VERTICAL		A	B	C	D	E	F	G	H	J
CE75-V	mm	2425	1020	1098	170	2173	N/A	N/A	55	1037
CE100-V	mm	2425	1020	1098	170	2173	N/A	N/A	55	1037
CE125-V	mm	4625	1020	1098	170	2193	2206	N/A	55	1037
CE150-V	mm	3525	1020	1098	170	1094	2206	N/A	55	1037
CE175-V	mm	4753	1335	1272	288	1385	3003	N/A	80	1171
CE200-V	mm	4753	1335	1272	288	1385	3003	N/A	80	1171
CE225-V	mm	4753	1335	1272	288	1385	3003	N/A	80	1171
CE240-V	mm	4753	1335	1272	288	1385	3003	N/A	80	1171
CE250-V	mm	6228	1335	1272	288	1385	3003	N/A	80	1171
CE300-V	mm	6228	1335	1272	288	1385	3003	N/A	80	1171
CE360-V	mm	4783	1335	2436	317	1456	2930	N/A	80	2221
CE450-V	mm	4783	1335	2436	317	1456	2930	N/A	80	2221

WEIGHTS

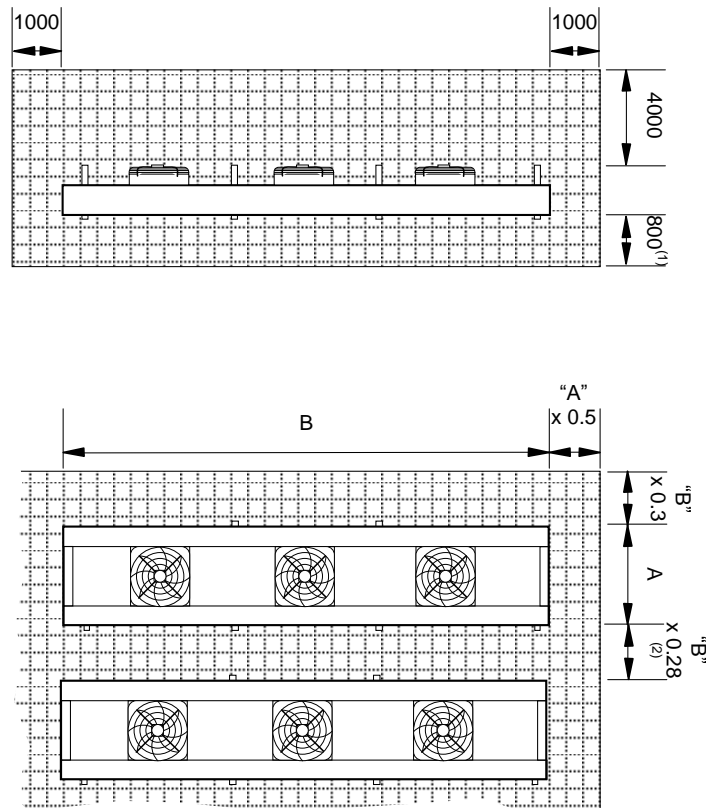
Refer to **General Specification**.

Condenser Installation Data

UNIT LIFTING

- Employ lifting specialists.
- Local codes and regulations relating to the lifting of this type of equipment should be observed.
- Use the appropriate spreader bars/lifting slings with the holes/lugs provided.
- Lift the unit slowly and evenly.
- If the unit is dropped, it should immediately be checked for damage and reported to Airedale Service.

POSITIONING



- (1) 1 Row of fans, when 2 rows, allow 1.5m between structure and unit.
 (2) Free field, for enclosure allow "B" x 0.5.

The installation position should be selected with the following points in mind:

- Position on a stable and even base, levelled to ensure that the compressor operates correctly.
- Levelling should be to +/- 5mm
- Observe airflow and maintenance clearances.
- Pipework and electrical connections are readily accessible.
- Where multiple units are installed, due care should be taken to avoid the discharge air from each unit adversely affecting other units in the vicinity.
- Within a side enclosed installation, the fan MUST be higher than the enclosing structure.
- Ensure there are no obstructions directly above the fans.
- Allow free space above the fans to prevent air recirculation.

Notes:



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PART NO:	ISSUE	DATE
903-120 TM E	A	01/07/04
	B	02/08/04
	C	01/06/09
	D	02/2011
	E	09/2012
	V1.5.0	02_2013
	V1.6.0	07_2014
	V1.7.0	10/2014
	V1.8.0	10/2015
	V1.9.0	12/2015
	V1.10.0	01/2016
	V1.11.0	03/2016
	V1.12.0	04/2016